

Thoughts on the Biological Processes of Life**Erich Ebner**

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Abstract

The physical chemistry, biochemistry and physiology strive to research life and life processes. A difficulty arises from the connection with the evolutionary processes. This basic dependency is particularly bound by the basis of physical processes. Quantum mechanical explicable phenomena play an outstanding role. The life forms of our habitat are so high and diverse that the analysis of the life processes and their dynamics are difficult to differentiate. Nevertheless, it can be said to date with the current state of science that physical laws and reactions are the starting point for development. Atoms and molecules have formed the energy of space. The kinetic energy of the chaos enabled the development of prebiotic molecules and, in interaction with the medium water, the development of life forms began in our habitat earth.

Keywords: Basic Processes of Biological Life, Quantum Mechanical Foundations

Introduction

Since time immemorial there has been a desire to understand, explore and interpret the world. Even the earliest ancestors of the Mediterranean and Near Eastern civilization observed nature and used their knowledge for everyday life. Much remained misunderstood and was described with mythical interpretations. Systematic and scientifically oriented thinking developed in ancient philosophy. Over the centuries, the different methods and disciplines have differentiated.

In this consolidating process, philosophy developed, which in turn led to an increasingly scientific view, including logic. And with these sciences, the knowledge and the laws of nature hardened rapidly. Although we are aware of important discoveries in antiquity, for example from outstanding Greek personalities such as Socrates, Pythagoras, Aristotle, Galenus and others, a systematic and scientifically deeper consideration of what is happening in the world only began in the early modern period. This separated philosophy from the natural sciences more and more. With the formulation of quantum mechanics, the scientific view of nature reached a new high point, which brought with it a more difficult understanding in its approach, even though quantum mechanics contains the basis of the deepest knowledge. But this emerging gulf of understanding again requires the incorporation of philosophical consideration. In this sense Anton Zeilinger is quoted, who formulated the following assessment in his lecture on the interpretation and the philosophical foundations of quantum mechanics: "When investigating various interpretations of quantum mechanics, one notices that each interpretation contains an element which escapes a complete and full description [1]. This element is always associated with the stochastic of the individual event in the quantum measurement process. It appears

that the implication of this limit to any description of the world has not been sufficiently appreciated with notable exceptions of, for example, Heisenberg, Pauli and Wheeler. If we assume that a deeper foundation of quantum mechanics is possible, the question arises which features such a philosophical foundation might have. It is suggested that the objective randomness of the individual quantum event is a necessity of a description of the world in view of the significant influence the observer in quantum mechanics has. It is also suggested that the austerity of the Copenhagen interpretation should serve as a guiding principle in a search for deeper understanding." The physics of energy is the origin and basis of all being and passing away. From this point of view, there is also an understanding of life processes, from the first biological phenomena to the life forms defined by us.

Discussion

The influence of physical forces on biologically active organic molecules and their physiological reactions are decisive. Resonance and magnetism are central factors. The response should be the definition of the context [2]. Resonance means a vibrating system because another vibrating system is linked. The resonance energy as the basis of this appearance indicates an energy transfer in this system and is effective when both systems have the same frequency. The energy fluctuation is the principle of response.

A special condition for organic matter on earth is magnetism. Depending on the structure of the molecules, it is defined in terms of its mode of action as paramagnetism or diamagnetism. The energy of the electromagnetic field determines what is happening. It should be considered whether theoretically defined facts such as wave function show a real participation. The wave

function describes the quantum mechanical condition of the systems of elementary particles. According to the Copenhagen interpretation of quantum mechanics, the wave function contains all information of an entity or the entire system. The Schrodinger equation can be seen as an energy conservation set of quantum mechanics from a wave particle dualism.

An electron has a turning impulse that is the result of the self-rotation around its own axis. This means that an electron has a magnetic moment. This magnetic moment is interacted with an outer magnetic field. Magnetic moments of the kernels have a local magnetic field. This local magnetic field is unequal to other different fields, so that an electronic rail speed is generated. This structural dependency characterizes the molecule compared to physical influences.

These quantum mechanical relationships are the basis of chemical processes and thus the basis of all biochemical processes and physiological reactions of organic matter. The associated energy transfer determines the entire self-contained regulation system via the response in the sense of feedback regulation.

The idea that a sudden failure of an organism leads it to death is real, but appears superficial in the statement. There must be a suddenly onset of fault. What is this to be found? In any case, it lies in the system of termination of physical but evolutionarily adapted influence and its effect on molecular biochemical compounds and pre-groans, so that physiological processes fail ad hoc. A biochemical acute energy loss alone can hardly cause this. This must be searched for even more precise definitions. Two fundamental options must be observed:

- Failure of an organism in connection with the biologically defined life of life and
- Failing an organism through external biological processes and influences such as viral or bacterial or other forms of independent organisms that affect the host as a livelihood. In this case, a failure of the organism is to be defined as exhaustion.

Death is no coincidence. It can only be defined by a physiological failure that comes to the basis of a termination of evolutionary relationships. And the basis for this is physical laws and their mutual dependency and interaction in biological structures.

How could this complex system have developed? Atoms created from energy, further development under the conditions of space and the formation of the first pre-organic molecules were the basis. And with every development step, you have to assume that new physical dependencies and relationships have developed and led to new forms. Certainly, this consideration of the development per se is not new, but understanding for this requires new ways of thinking.

As can be seen from what is shown, quantum mechanics represents a fundamental explanation of fundamental processes, although Feynman's statements should not be overlooked that, as he said, nobody completely understands quantum mechanics. Of course, this also involves fundamental considerations on the philosophy of quantum mechanics, as discussed by Zeilinger.

But this approach has been confirmed as the basis for the development of sciences. Supported by the thought of explaining and understanding all things in the environment, philosophy has always played and played a special role. Of course, science has taken a rapid development, brought an incredible discoveries and insights, but every new understanding raises new questions. And these can often only be put on the right track by more or less speculative monuments.

The question of how life was created on earth is omnipresent and affected with a wide variety of explanatory attempts. Physics undoubtedly play a central role. But from a mechanistic point of view, it complements itself with the science of chaos research, which plays a special role in terms of life, especially in terms of life [3]. Because the potential possibility of a system behave chaotic can be of an extraordinary advantage. Through targeted perturbation of a parameter, a number of different periotic movements can be explained, controlled and stabilized from the chaotic area, so that in principle one and the same system can be designed and designed for different tasks. One could imagine that systems in the lively nature of these regulatory mechanisms use in order to be able to react flexibly to changes.

As biological life forms evolve, regulatory mechanisms may change, expand, and take on specific forms, but the underlying physical influences remain the same. But the knowledge of quantum mechanics has expanded with Pauling's quantum chemistry. The path to life forms as defined by Nurse and Schrodinger is unclear in many respects [4, 5]. And yet that path is conceivable that physically defines the process of life.

As shown, an organism is in a state of fluctuation of energetic processes. A controlling link is resonance. And these resonance-related control circuits are becoming more and more complicated but also more vulnerable depending on the evolutionary further development and differentiation of the organisms. A "simple" organism may be more resistant to certain environmental influences than a highly developed creature.

If you look at the system of energy and matter, you will find two materially different forms of matter, at least in relation to our solar system, despite uniform energetic conditions in

space. The inorganic matter forms manifestations that exist almost forever. Just think of crystals, which can form over and over again, but have a persistence that remains unchanged for millennia or more. Organic matter, on the other hand, consists of a comparable range of atoms, has a dynamic character and is transient in the usual units of time.

If one assumes, as already mentioned, that life developed from precursors of organic matter, one must inevitably assume that these molecules have the ability or have developed according to physical principles to develop an independent dynamic.

Taking water as an example. Inorganic it forms crystals, infinitely stable. Organically, it should be the basis of the development of organic life and serve to preserve it with its diverse phys-

ical properties. But these properties are no coincidence. One knows from knowledge of quantum chemistry that the energetic processes in connection with other atoms and molecules form a highly complex system through which all biological processes are controlled. Structural formations of all kinds, as well as growth, metabolism, reproduction, physiological processes and everything, that corresponds to the definition of life.

But can one explain the cessation of viability? Generally speaking, one speaks of exhaustion, loss of energy, collapse. Because a constant supply of energy into the system of life takes place and must take place. Conservation of entropy is inevitable. From a scientific point of view, this explanation is too general in everyday life and naturally raises the question: Why?

The theory of synergetics could be used as an explanation, according to which the creation of new qualities in an open system, structures and functions can only be maintained by a constant transport of energy and matter. However, this explanation seems abstract.

As Ott and co-workers put it as considerations from chaos research, there is the potential possibility of a system behaving chaotically, and this can be of extraordinary advantage [6]. Through targeted perturbations of a control parameter, a number of different periodic movements can be controlled and stabilized from the chaotic area, so that in principle one and the same system can be designed and thus designed for different tasks. One could imagine that systems in living nature make use of these regulatory mechanisms in order to be able to react flexibly to changes in external conditions.

It makes sense to get rid of the idea that life can only develop in habitable zones like the earth. Organic molecules formed in free space. With the addition of kinetic energy, these molecules can accumulate according to the laws of chaos, allowing higher structures such as early amino acids to form. The statement that life is only possible in connection with presence of water does not contradict this development. Water as amorphous water or water ice exists in space [2]. Therefore, it can deposit wherever inorganic material is present.

The thought expressed that a porous surface of a rock formation, be it a planet or a comet, is quite sufficient as a "niche" to lead to a conglomerate over a period of time under these conditions. The missing physical environmental factors necessary for the development of a life defined in human terms may not always be present. Nevertheless, this assumption could be for the discovery of pre-molecular structures, which science is currently finding in many places, such as on Mars or comets. The conditions for a further development of the structures can be temporary, so that the further development to higher, more differentiated compounds breaks off.

Findings of life forms on earth, i.e. in our habitat teaches us that development of life forms can also exist under special conditions, such as in volcanic vents in the deep sea [7]. Life forms exist here despite distinctly different conditions. From this one

can conclude that phenomena of life can exist in foreign habitats. Their morphological structures can be different. Because it is true that energy and its laws create life-conditions of whatever kind. And if one defines the world in the various contexts of the totality of comprehensible and knowable things and their relationships to one another, important conclusions emerge.

One may well assume that the physical conditions and laws of the energetic processes in space are the same. But the morphological, i.e. the atomic and molecular compositions of the matter there and distant habitats could be different and thus formative for the development of life forms.

But what is happening at the molecular level? These events could be universal. Therefore, back to the consideration of the spin as an expression of the intrinsic angular momentum of the electrons. The rotation creates a magnetic dipole moment around each electron. The pulse generated by the local magnetic field is characterized by frequency and amplitude, and at the same time frequency and amplitude are responsible for the effect on energy transfer, with the amplitude depending on the total energy of the system. And this is where water, with its character of ability to transform into a multitude of anomalies, very likely comes into play. It is generally assumed that this diversity of properties forms the basis for the emergence and preservation of life. Among other things, the ability to store heat and the defined release of frequencies as well as the peculiarities resulting from its structure as a molecule should be emphasized. With regard to the processes in space, water is said to have the property of being an "interstellar catalyst". Short chains of hydrogen molecules, as studied at DESY (German Electron Synchrotron/Research Center of the Helmholtz Association), pump protons into the cells with the help of proteins, whereby the proteins are folded [8]. In relation to this, one can assume that in the water-enriched organic structures, a high-energy dynamic system is created by pre-molecular formations, which leads to new states as long as the physical conditions do not break off.

It is permissible to fall back on findings from magnonic theory. According to their findings, which, however, relate to magnetic materials, the magnetic moments of the electrons are linked by an interaction between which informal data float back and forth. The magnetic field created in the spin wave plays a role in this propagation. This involves an energy transfer. The question arises to what extent such physical processes play a universal role in the development of viable structures.

After all, one has to assume that in the system of the mutual dependence of amplitude and frequency there is a possibility of influence, which leads to the maintenance of the system or the collapse of the control loop in the event of a drop in energy. In the biological sense, this would lead to stagnation or the termination of development. The loss of water would be equated with the loss of energy supply in a "biotope".

In order to recognize the properties of nature, one must use the analytical method. The breakdown into recognizable individual parts allows conclusions to be drawn from their behavior. Never-

theless, it is a closed system. To put it in classical literary terms, Johann Wolfgang von Goethe is quoted as saying: "I now have the parts in my hands, unfortunately the spiritual bond is still missing".

Conclusion

Physical laws determine chemical, biochemical and physiological processes. Thus, organic matter and thus life in its physiological presence are evolutionarily bound to natural laws. The basis of the processes of viability is water with its diverse physical properties. This structural variance allows for the diversity in the evolution of organic compounds and the dynamics of interaction. Energetic exchange and resonant behavior of organic molecules lead to the stability of life forms. Referring to higher developed organisms one has to realize that these physical mechanisms decide about the stability of life or death. Thus, the death of an individual is no coincidence.

But the question remains, how far can life exist outside of our habitat? There seems no doubt that it can be so. But the meaning of natural law reactions can be different, since the constellation of the interaction of the natural laws with possibly different atomic composition leads to organic molecules that do not correspond to our habitat. But life, in whatever form, can be possible.

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